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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/925,942	08/10/2001	Yoshio Satoh	21.1966-CRE-C	6889

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EXAMINER

SUMMONS, BARBARA

ART UNIT PAPER NUMBER

2817

DATE MAILED: 08/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/925,942

Applicant(s)

SATO ET AL.

Examiner

Barbara Summons

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 May 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,6,22-33 and 35-37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 22-24,30,31 and 35-37 is/are allowed.
- 6) ☒ Claim(s) 1,6,25-29,32 and 33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

REISSUE/DETAILED ACTION

New Grounds of Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. § 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 32 and 33 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Each of Claims 32 and 33 recites the limitation "the second SAW filter" on lines 2 and 3 thereof, respectively. There is insufficient antecedent basis for these limitations in the claims since "SAW" was removed from the independent claim 30.

Withdrawal of Previously Indicated Allowable Subject Matter

3. The indicated allowability of claims 1, 6 and 25-29 is withdrawn in view of the fact that some of the claims should have been included in the rejection of claim 34 made in the prior Office action mailed 1/13/04. Therefore, this Office action will not be made final. The rejection follows, along with a rejection based on the prior rejection plus a newly cited reference.

New Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1, 6, 25, 26 and 29 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Hikita et al. U.S. 5,115,216 (of record) taken in conjunction with Hikita JP 59-158117 (of record).

Figs. 1 and 3 of Hikita JP '117 discloses a band-pass filter (Fig. 2) having a pair of common signal terminals (i.e. the antenna terminal and a ground associated therewith) and plural pairs of band-pass filter signal terminals 4/Tx and 5/Rx and the grounds associated therewith (see Fig. 3), comprising: a pair of surface acoustic wave (SAW) filters 2 and 3 each having respective pass bands and pairs of input/output terminals (e.g. 4 and 5 and the grounds associated therewith on the lower sides of the interdigital transducers 10/12, and similar for the antenna side of the filters).

However, Hikita JP '117 does not show the SAW filters comprising a plurality of SAW resonators connected in a multiple ladder structure with a series resonator at the first stage located at the side of the common signal terminals, or an impedance matching circuit/inductance element (claims 25,26/1) directly connected between the common terminals to be in parallel with a SAW filter/second SAW filter having the highest frequency (claims 1/25).

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Hikita et al. U.S. '216 discloses SAW ladder filters (Figs. 1 and 4) comprised of SAW resonators formed by series and parallel arms (best seen in Fig. 4), and clearly shows the pairs of common input/output terminals (1/1' and 2/2'). Although Hikita U.S. '216 does not show a duplexer, i.e. a band pass filter having a pair of band pass filters with a pair of common signal terminals and plural transmit/receive terminal pairs, Hikita U.S. '216 does disclose its filter for use as transmitters and receivers in mobile phones (see col. 1, lines 8-16) which one of ordinary skill would have known included duplexers. Hikita U.S. '216 also clearly shows series arm resonators at the first stage on both the input/output ends of the filter (Fig. 4), and an impedance matching circuit including an inductor 3-2 (see col. 6, lines 19-20) coupled directly to the common terminals 1/1' so as to be in parallel with the SAW filter (i.e. the two input terminals of the filter being the input to 4-1 and the ground at 4-3 all of the grounds in the figures being equivalent).

Consequently, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the duplexer/band pass filter of Hikita JP '117 (Figs. 1 and 3) by having substituted the SAW ladder filters of Hikita et al. U.S. '216 (Figs. 1 and 4), including first stage series arm resonators and matching circuit/inductors 3-2, in place of the SAW filters 2 and 3 of Hikita JP '117, because such an obvious modification would have been the mere substitution of art recognized alternate SAW filters and because the SAW ladder filters would have provided benefits of less losses in the acoustic/electric conversion, better power handling, and better frequency characteristics than the transversal type filters in the JP reference as explicitly suggested by Hikita et al. U.S. '216 (see col. 1, lines 18-63).

Additionally, it would have been equally obvious to one of ordinary skill in the art at the time the invention was made to have modified the SAW filter of Hikita et al. U.S. '216 (Figs. 1 and 4) by having used two of them in a duplexer/dual SAW band pass filter because Hikita et al. U.S. '216 explicitly suggests using its filters with first stage series arm resonators and matching circuit/inductors in mobile phones (see col. 1, lines 8-16) which one of ordinary skill in the art would have known included duplexer/dual SAW band pass filters, as suggested by the exemplary teaching of Hikita JP '117 (Figs. 1 and 3). Regarding claim 29, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the matching circuit of the combination to include a series capacitor because such an obvious modification would have been the mere substitution of art recognized equivalent impedance matching circuits, including for example, L-type circuits, T-type circuits and π -type circuits utilizing inductive and/or capacitive elements, depending upon the application, as would have been known by one of ordinary skill (see also other art of record as evidence).

In conclusion, SAW duplexers with two SAW filters of different pass bands were known before the invention, and SAW ladder filters with pairs of terminals, first stage series arm resonators and matching circuit/inductors were known before the invention and were intended for use in such SAW duplexers.

6. Claims 27 and 28 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Hikita et al. U.S. '216 in conjunction with Hikita JP '117 (both of record) as applied to claim 25 and 26 above, and further in view of Setsune et al. U.S. 4,409,567.

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The Hikita U.S. '216/Hikita JP '117 combination discloses the invention as discussed above, except for disclosing the matching circuit inductor formed of a metallic strip line on a ceramic package.

Setsune et al. discloses that it would have been known in the SAW filter art to provide matching circuit inductors (see e.g. L1 in Fig. 4) as a strip line 14 (Fig. 5) on a ceramic package substrate (see e.g. col. 5, lines 64-68 and col. 6, lines 6-15). Setsune et al. also provides evidence of matching circuits with capacitors.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the SAW band pass filter/duplexer of the Hikita U.S. '216/Hikita JP '117 combination by having provided the matching circuit/inductor 3-2 (Hikita U.S. '216 Figs. 1 and 4) of the combination as a metallic strip line on a ceramic package as taught, for example, by Setsune et al. (Figs. 4 and 5), because such an obvious modification would have provided the advantageous benefit of miniaturization of the device by providing the matching circuit/inductor within the package as suggested by Setsune et al. (see col. 6, lines 9-12), and because both Hikita references are silent as to the packaging of the SAW filters/duplexer, thereby suggesting to one of ordinary skill that any well known package, such as the ceramic substrate package with matching circuit of Setsune et al., would have been usable therewith.

Allowable Subject Matter

7. Claims 22-24, 30, 31 and 35-37 are allowable over the prior art of record.

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Response to Arguments

8. Since there were no rejections in the prior Office action, except for claim 34, which was canceled by the amendment, no arguments were put forth by Applicants. Consequently, no response by the Examiner is necessary at this time. Once again, due to the withdrawal of previously indicated allowable subject matter, and the rejections above which properly should have been made in the prior Office action, this Office action is not made final.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Barbara Summons whose telephone number is (571) 272-1771. The examiner can normally be reached on M-Th, M-Fr.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bob Pascal can be reached on (571) 271-1769. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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August 12, 2004



**BARBARA SUMMONS
PRIMARY EXAMINER**